



# GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Integrated Master of Computer Applications, 7<sup>th</sup> Semester

Subject Name: Advanced Android Programming

Subject Code: 2678602

With effective  
from academic  
year 2020-21

## 1. Learning Objectives:

- To be able to understand the process of developing software for the mobile with advanced features like location services, 3D drawing, Sensors,
- To be able to create app widget of mobile applications on the Android Platform
- To be able to create mobile applications involving wireless connectivity like Wi-Fi.

## 2. Prerequisites:

- Knowledge of the Core Java Programming, fundamentals of how to build an Android app using the Java language

## 3. Contents:

Unit No.	Course Content	Weightage Percentage
I	<b>Handling Advanced User Input</b> Working with Textual Input Methods, Handling User Events, Working with Gestures <b>Extending Android Application Reach</b> Working with App Widgets, Working with Live Wallpapers, Creating a Live Wallpaper  <b>Modern UI components</b> like recycler view and card view Cache mechanism.	15%
II	<b>Using Android Networking APIs</b> Understanding Mobile Networking Fundamentals, Understanding Strict Mode with Networking, Accessing the Internet (HTTP) <b>Using Android Web APIs</b> Browsing the Web with Web View, Building Web Extensions  <b>Using Location and Map APIs</b> Incorporating Android Location APIs, Incorporating Google Location Services APIs, Incorporating Google Maps Android API v2	20%
III	<b>Accessing Android's Hardware Sensors</b> Interacting with Device Hardware, Using the Device Sensors, Sensor Event Batching, Monitoring the Battery  <b>Using Android's Optional Hardware APIs</b> Working with Bluetooth, Working with USB, Working with Wi-Fi	20%
IV	<b>Working with Google Cloud Messaging</b> Understanding GCM Message Flow, Understanding the Limitations of the GCM Service, Signing Up for GCM  <b>Enabling Application Statistics with Google Analytics</b> Creating a Google Account for Analytics, Adding the Library to Your Android IDE Project, Collecting Data from Your Applications, Logging Different Events, Using the Google Analytics Dashboard, Gathering Statistics, Protecting Users' Privacy	25%



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<b>V</b>	<p><b>Developing Android 3D Graphics Applications</b> Working with OpenGL ES, Using OpenGL ES APIs in the Android SDK, Handling OpenGL ES Tasks Manually, Drawing 3D Objects, Interacting with Android Views and Events, Cleaning Up OpenGL ES, Using GLSurfaceView</p> <p><b>Internationalizing Your Applications,</b> Localizing Your Application's Language, Translation Services through Google Play</p> <p><b>Protecting Applications from Software Piracy</b> Using Secure Coding Practices, Obfuscating with ProGuard</p>	<b>20%</b>
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**Desirable Topics:**

- 1) Basics of Android Memory Performance Improvement Tools
- 2) Google Places API

**4. Text Book:**

- Joseph Anuzzi, Jr. Lauren Darcey, Shane Conder, "Advanced Android™ Application Development", Fourth Edition, Pearson

**5. Reference Books:**

- The Busy Coder's Guide to Advanced Android Development by Mr. Mark L Murphy
  - Professional Android by Reto Meier, Ian Lake, Wrox Publication
- Web references
- <https://developer.android.com/index.html>
  - Advance Android Developer Course by Google (<https://developer.android.com/courses>)

**6. Chapter wise Coverage from Text Book:**

Unit No	Book#	Chapters
1	1	Chapter 8, 26 <b>Modern UI components</b> like recycler view and card view and Cache mechanism. - refer web <a href="https://developer.android.com/index.html">https://developer.android.com/index.html</a>
2	1	Chapter 11, 12, 17
3	1	Chapter 15, 16
4	1	Chapter 18, 20
5	1	Chapter 24, 29, 30

**Tools/Technologies to be used:**

- 1 ANDROID Studio [Latest Version]
- 2.ANDROID Version [Jelly Bean and later]

**7. Accomplishments of the student after completing the course:**

Student will visualize the real-world mobile application scenario with advanced features and enables them for development and implementation of mobile applications



**8. Suggestions for Lab Sessions:** (Project to be developed by students which includes implementation of all the above topics of advanced android features)

**A. General Guidelines**

- Project Group: 2-3 People.
- The project should be free from plagiarism of any kind.
- It is mandatory that the project should be developed using Android Studio 2 later version on Linux or Windows Platform.
- This may not be a live project

**B. Expected Outcome**

- The objective of the Mobile Application development using Android is to make students aware about the industry-based process and workings. As a result, Application must meet with the industry standards.
- There will not be any compulsion to prepare a project report for the students but an application should be demonstrated, so that evaluator may get the detail about the Project developed and can evaluate the students as per the evaluation criteria.
- More project definition can be found at <https://nevonprojects.com/project-ideas/android-project-ideas/>.
- Preferably application may be uploaded on app store

**C. Evaluation Parameters :**

- Evaluation of the Mobile Applications would be done considering the advanced concepts learned in the subject. The main parameter of assessment would be the ability of the students to code.
- Though the App and domain specific knowledge would be assessed for, the evaluation would predominantly depend on the students' ability to explain, modify or revise of code.
- Coding standards should have been implemented.
- Though the Application would be evaluated for the entire team, the examiner should emphasize on the contribution of each team member in the project development

Sr. No	Particulars	Weightage
1	Project	10%
2	Advanced Feature Implementation ( Any two) <ul style="list-style-type: none"><li>• Maps and location based services</li><li>• SMS Integration ( Automatically taking SMS as input)</li><li>• API Integration</li><li>• Modern UI components like recycler view and card view.</li><li>• Hardware / Sensor Integration</li><li>• Advanced Graphics and Views</li></ul>	40%
3	Code Changes	25%
4	VIVA	25%